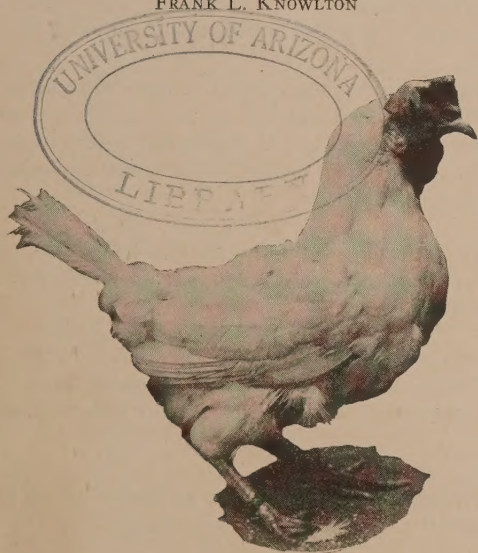


Force-Molting of White Leghorn Hens

By

FRANK L. KNOWLTON



Agricultural Experiment Station
Oregon State Agricultural College
CORVALLIS

SUMMARY

1. In response to requests from Oregon poultrymen for definite information regarding force-molting methods and their advisability, the Oregon Agricultural Experiment Station conducted comparative experiments with White Leghorn hens over a two-year period, 1934-35 and 1935-36.

2. Comparison of the records of the force-molted and the naturally molted flocks in these two experiments shows that force-molting was not profitable and cannot be recommended as a dependable method of increasing the income of Oregon poultrymen.

3. The mortality in the flocks force-molted, and subsequently kept under all-night lights, was about twice as high as in the naturally molted flocks.

4. Severe culling was necessary, moreover, in the force-molted flocks to keep flock production above 50 per cent, whereas no culling was required for the naturally molted hens.

5. The egg production of the naturally molted flocks was higher than that of the force-molted flocks.

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EXPERIMENTS to test the effectiveness of force-molting management have been conducted in several states with widely conflicting results. Such tests have been made in response to the desire of poultrymen to know whether it is profitable to force laying hens into an early molt, when large eggs are cheap, and then by the use of special feeding and all-night lights attempt to induce them to lay heavily during the fall months, when large eggs are scarce and high priced. The problem to be determined is, will a flock bring larger financial returns if forced into an early molt than if permitted to molt naturally.

EGG PRODUCTION VARIES

The egg production of a flock of hens exhibits rather definite seasonal trends. Pullets tend to lay small eggs when first brought into production during the fall but the egg size increases as production progresses. Normally the rate of production is heaviest in the spring of the year, falls off somewhat as the summer progresses, and drops sharply in the fall as the yearling and older birds molt. The higher producing birds will lay longer before molting than the low producers. The effect of these trends is that large eggs are less plentiful during the fall months.

Seasonal trends on egg prices. Egg prices also follow rather definite seasonal trends, being lowest during the spring season of heaviest production and higher during the fall season of low production. This seasonal egg-price trend formerly was much more marked than it is at present. Placing eggs in cold storage during the spring season for withdrawal and sale during the fall and winter exerts a leveling influence on the price curve, preventing it from going too low during the spring and summer, or unfortunately high during the fall and winter. Increased breeding of high-producing birds that will lay well into the fall months is another important factor in leveling the egg-price curve. It may be expected that in the future the egg-price curve will tend to become still more even rather than exhibit the marked seasonal fluctuations that were common 10 or 15 years ago.

Many poultrymen have believed that if yearling or even older hens could be induced to molt during the summer, when eggs are cheap, and then be brought back into the production of large eggs in the fall, when eggs are high, much larger financial returns would result.

EXPERIMENT COVERED TWO YEARS

Since many Oregon poultrymen desire information on the advisability of force-molting and the best method of inducing their hens to molt, experimental tests of this system of management were undertaken under Oregon conditions. The experiments were for 1934-35 and 1935-36.

Table 1. SUMMARY OF EXPERIMENT WITH FORCE-MOLTED AND NATURALLY MOLTED WHITE LEGHORN HENS SHOWING GROSS VALUE OF EGGS PRODUCED, AND PERCENTAGE OF MORTALITY AND CULLING IN RESPECTIVE FLOCKS.

Nature of molting	Hens in experiment				Production			Date for start of force-molting	Period for comparative checkings
	Total started	When hatched	Mortality	Culls	Pullet year average	Average per hen, first six months pullet year	Gross value of eggs per hen started	Loss in value of eggs produced by each force-molting hen	
	<i>Hens</i>	<i>Yr. Mo. Da.</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Eggs</i>	<i>Eggs</i>			<i>Yr. Mo. Da.</i>
1934-35									
Force-molting	132	3-5-33 to 4-17-33	18.5	60.7		121.3	\$2.33	\$.48	8-1-34 to 6-1-35
Naturally molted	102	3-5-33 to 4-17-33	6.9		237.7	124.2	2.81		8-1-34 to 6-1-35
1935-36									
Force-molting	124	3-5-34 to 4-30-34	28.2	41.1		105.3	2.36	.33	7-1-35 to 5-1-36
Naturally molted	123	3-5-34 to 4-30-34	15.4		229.2	113.6	2.69		7-1-35 to 5-1-36

Birds of same breeding. Flocks of individually pedigreed, trapnested Single Comb White Leghorns of the O. S. C. strain, were selected for the State College tests. The selection was made near the end of the first laying year. All birds were of similar breeding and as pullets had been kept under the same housing and other environmental conditions. In each year about half of the hens selected were force-molted and then placed under all-night lights, while the other half were handled as breeders, in other words permitted to molt naturally.

Start made in mid-summer. The force-molting was started on August 1, 1934, and on July 15, 1935. Among the birds there were a number that at these dates had not quite completed a full year of laying. The first year egg record would not be a fair measure of the production ability of these hens; as they were intentionally thrown into a molt and given a period of rest before the actual completion of a full year of laying. It has been shown that the hens that lay the most eggs in a year also lay the greatest number during the various parts of that year.

The first six months record was used, therefore, to compare pullet laying performance in the force-molted hens with those permitted to complete their year and then molt naturally. By this means the birds selected for testing each year were divided about equally between the naturally molted and force-molted flocks.

PROCEDURE FOLLOWED IN EXPERIMENT

The method used to force the molt in both years of the experiment is summarized briefly as follows:

FIRST SIX WEEKS

1. Hens were confined to a large house equipped with wire sun porch.
2. All egg mash was removed.
3. Drinking water was withheld for 12 hours on the first day of each test. (It was deemed that the weather was too hot to risk further curtailment of water.)
4. A small amount of grain, 6 pounds to each 100 hens, was fed daily in a deep straw litter. About one-third of this grain was fed in a morning feeding while the rest was fed in late afternoon. After five days, production having dropped sharply (Table 3), the amount of daily grain feed was increased to 9 pounds per 100 hens, and held at that rate until six weeks after the start of the test. About three weeks after the start the birds commenced to drop feathers.
5. Chopped green alfalfa was fed daily. During the first two weeks the quantity was kept at the amount they would clean up in half an hour; thereafter the hens had all they wanted.
6. Two weeks after the start millrun was supplied in mash troughs, the daily feeding being 4 pounds per 100 hens. Codliver oil, 1 quart per 100 pounds, was mixed with the millrun.
7. Grit and oystershell were available at all times.
8. No lights, milk, or feeds other than listed above were given during the first six weeks.

Table 2. MONTHLY DISTRIBUTION OF PRODUCTION, MORTALITY, AND CULLING FOR FORCE-MOLTED AND NATURALLY MOLTED WHITE LEGHORN HENS.

Month	1934-35						1935-36					
	Force-molted (132 hens)			Naturally molted (102 hens)			Force-molted (124 hens)			Naturally molted (123 hens)		
	Egg production	Mor-tality	Culls	Egg production	Mor-tality	Culls	Egg production	Mor-tality	Culls	Egg production	Mor-tality	Culls
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
July	49.8			66.1			34.5			61.3		
August	8.2	.7		60.3			3.4	1.6		54.0	2.4	
September	22.6	1.5		43.8			22.5	3.2		45.1	.8	
October	59.8	2.2		28.4			58.1	4.9		31.3		
November	58.9	3.8		17.6			54.9	3.2		18.3		
December	58.0	2.2		27.0			52.0	1.6		21.3	1.6	
January	50.6	1.5		40.2	.9		55.1	5.7		37.3	4.0	
February	55.7	4.4		55.6	2.0		52.2	3.2	12.9	53.4	2.4	
March	51.0	.7		62.1	1.0		58.3	1.6	9.6	62.5	3.4	
April	54.1	1.5		65.3	1.0		58.0	3.2	6.5	66.9		
May	58.5		10.0	61.4	2.0				12.1			
Total		18.5	60.7		6.9			28.2	41.1		15.4	

SEVENTH WEEK AND THEREAFTER

1. Birds were confined to laying house and wire sun porch and given all-night lights. Each mash trough was illuminated with one 10 watt lamp.
2. Laying mash was kept in troughs before the birds at all times.
3. One daily feeding of grain, in mid-afternoon, was given the hens, 9 pounds per 100 hens.
4. The birds were given one generous feeding of chopped green feed daily at noon. The quantity was approximately what they would clean up in an hour.
5. Grit, oystershell, and bone were before the birds at all times.

Management of naturally molted birds. Owing to the fact that the naturally molted birds were used as breeders, no artificial lights or moist mashes were used on them. If the production of commercial eggs had been the only consideration, lights and moist mashes could have been employed to raise their fall and winter production somewhat above the percentages attained.

Natural molting best. The force-molted flocks did not lay as many eggs as did the flocks permitted to molt naturally (Table 1), and the eggs they laid did not bring as much money as those from the naturally molted flocks. Mortality during the experimental period was about twice as high with the force-molted as for the naturally-molted birds. In addition to the higher mortality, it was necessary to cull an average of nearly 50 per cent of the original number of force-molted hens in order to keep the egg production of the birds remaining in the flock above 50 per cent.

No culling of the naturally molted flocks was made, so that of the original hens, 93 and 84 per cent in the first and second tests respectively, were left in the flocks and were laying well at the conclusion of the experiment. In the force-molted flocks only 21 and 43 per cent respectively of the original hens remained at the end of the experiment. Table 2 presents detailed information concerning the monthly mortality.

Trapnesting basis for culling. In the 1934 test the force-molted hens were not trapnested after they had molted, the assumption being that ordinary culling technique could be employed to remove the birds that dropped below the 50 per cent production rate. It was discovered, however, that the abnormal management to which the birds had been subjected rendered ordinary culling rules almost useless. The force-molted birds in the 1935 test, therefore, were individually trapped, and culling was done on the basis of their trapnest records rather than solely on ordinary culling principles.

In order to determine whether the mortality, culling, and production percentages would differ between groups of birds that had laid at different rates during their first production year, the birds in the 1935 test were grouped according to the records of the first six months of their pullet year (Table 3). The results of these groupings indicate that, within the production groups available for comparison, the force-molting and all-night lighting affected all groups about equally, no significant trends being apparent.

Table 3. MONTHLY PERCENTAGES OF MORTALITY, CULLING AND EGG PRODUCTION FOR FORCE-MOLTED AND NATURALLY MOLTED WHITE LEGHORN HENS, GROUPED ACCORDING TO THEIR PRODUCTION FOR THE FIRST SIX MONTHS OF THEIR PULLET YEAR.

Groups according to laying records for first six months of pullet year	Number of hens	Production		Monthly percentage egg production												Mortality July to May		Culls July to May	
		Range	Average	Eggs	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	Per cent	Per cent			
																	Eggs		
<i>Force-molted</i>																			
Group 1	13	131 to 145	135.5	41.4	5.4	28.7	62.8	66.2	59.2	60.4	57.5	52.7	67.9	38.5	38.0				
Group 2	32	116 to 130	121.9	38.3	2.6	27.6	67.9	61.1	61.6	61.7	58.8	62.5	55.5	18.8	46.9				
Group 3	26	101 to 115	108.9	32.7	5.9	21.1	52.2	48.4	41.5	43.7	55.5	54.3	59.9	26.9	42.3				
Group 4	32	85 to 100	92.6	31.3	1.8	20.3	54.0	51.2	47.9	53.1	50.1	55.5	58.4	25.0	40.6				
Group 5	21	84 and below	75.5	31.2	2.4	15.1	49.3	50.4	53.7	58.4	48.4	52.9	53.0	42.9	30.8				
All groups	124	All	105.3	34.5	3.4	22.5	58.1	54.9	52.0	55.1	52.2	58.3	58.0	28.2	41.1				
<i>Naturally molted</i>																			
Group 1	18	131 to 145	133.3	66.5	61.6	55.0	36.0	18.3	22.0	44.7	66.3	72.5	78.2	16.6	None				
Group 2	46	116 to 130	121.5	61.4	57.6	46.6	33.4	23.5	22.8	37.0	52.4	59.4	63.5	17.4	None				
Group 3	35	101 to 115	108.4	58.3	47.2	38.3	27.0	16.0	21.4	33.4	59.3	61.6	66.3	14.3	None				
Group 4	18	85 to 100	95.2	63.0	67.4	45.9	34.1	10.4	19.7	35.7	49.4	59.4	62.4	11.1	None				
Group 5	6	84 and below	79.0	52.1	42.4	39.4	16.6	15.0	13.4	39.2	55.4	64.5	63.3	16.6	None				
All groups	123	All	113.6	61.3	54.0	45.1	31.3	18.3	21.3	37.3	53.4	62.5	66.9	15.4	None				